Anesthesiology
1998; 89:805

Use of a Guide Wire to Facilitate Tracheal Intubation with the Bullard Laryngoscope

To the Editor:—Numerous techniques involving various guide catheters and stylets have been used to assist in the placement of endotracheal tubes *via* the Bullard laryngoscope. Circon ACMI (Stamford, CT) makes a multifunctional stylet for use with the Bullard laryngoscope that is hollow and that can accommodate an endotracheal tube changer (11 French) or a flexible catheter. I have used a technique in which a Cook (Cook Incorporated, Bloomington, IN) Amplatz extra stiff wire with atraumatic tip (0.038-inch diameter, 110-cm length) is passed through the working channel (*via* the stylet port) into the trachea. A Cook tracheal exchange catheter (14–19 French, 70 cm length) is then passed over the wire into the trachea, followed by an endotracheal tube.

I have found that placement of the Bullard laryngoscope into the patient's mouth and subsequent visualization of the vocal cords requires less manipulation of the laryngoscope when it is used without an attached stylet. When compared with the smaller diameter tube changers that can be passed through the Circon multifunctional stylet, a larger tube changer, using the technique I described, may decrease the chances of the endotracheal tube hanging up on laryngeal structures. A disadvantage of the technique I described, compared with using an attached stylet, is that the placement of the endotracheal tube through the vocal cords is not visualized.

I have had good success with this technique and hope that others find it helpful.

Eric C. Ringwalt, M.D.
Staff Anesthesiologist
Naval Hospital Cherry Point North Carolina
New Bern, North Carolina

(Accepted for publication May 11, 1998.)

Anesthesiology
1998; 89:805–6

Air Embolism during Anesthesia for Shoulder Arthroscopy

To the Editor:—Venous air embolism has been reported during neurologic and cardiothoracic procedures, but only one report describes it during arthroscopy.[1] We report an additional case that occurred during shoulder arthroscopy.

A 40-yr-old healthy woman was scheduled for arthroscopy of the left shoulder. There was no history of allergy or reactive airway disease. She was administered general anesthesia with sevoflurane/nitric oxide/oxygen after placement of an interscaline block. Ventilation was controlled. The patient was placed in the beach-chair position. After the skin incision was made, the surgeon injected 60 ml air into the joint, after which the arthroscope was inserted. This was followed by the infusion of saline into the joint. Within 3 min after the insertion of the arthroscope, the end-tidal carbon dioxide (ET_{CO_2}) decreased to less than 10 mmHg. The oxygen saturation by pulse oximetry (SpO_2) decreased to less than 90% before the signal acquisition was lost. Blood pressure measurement was unobtainable. The electrocardiogram showed a sinus rhythm at 90 beats/min. Anesthetics were discontinued, manual ventilation with 100% oxygen was begun, surgery was discontinued, and the patient was placed in the supine position. No pulse was felt in the groin or the neck, and closed chest massage was begun. At the same time, 1 mg intravenous epinephrine was administered. After approximately 3 min, spontaneous pulses were palpated. A radial artery catheter was placed, revealing a pressure of 160/100 mmHg. Oxygen saturation remained below 90%, but the capnogram returned to normal height with an end-expiratory value of 34 mmHg. The oxygen saturation gradually rose to the low 90% range. An arterial blood gas sample showed a pH of 7.25, a P_{O_2} of 64 mm Hg, a P_{CO_2} of 48 mmHg, and a base deficit of −6. The patient was transferred to the intensive care unit. Serial cardiac enzymes did not reveal myocardial infarction. Subsequent chest radiography was consistent with mild pulmonary edema and elevated right hemidiaphragm, but not pneumothorax. The patient was extubated the next day and discharged from hospital in good condition on the second postoperative day.

When cardiopulmonary resuscitation was begun, we were not aware of the insufflation of air because it was used for the first time by this surgeon. Later, we learned that 60 ml air had been injected followed by a jet stream of crystalloid solution.

The Australian Incident Monitoring Study (AIMS) reported the overall incidence of detectable venous air embolism in 2000 incidents to be 1%.[2] The surgical field was the entry field in 63% of cases, 47% occurred during head and neck surgery. The incidence of venous air embolism is increased to 15% when the patient is in the sitting position, as in neurosurgical procedures and forceful insufflation[3] of air into the operating field. Slow infusion of air or small amounts of air

might be undetected in the anesthetized patient and may occur more often than reported. By control, the rapid changes seen in our patient suggested the injection of air over a short period. In our patient, the disappearance of the end expired carbon dioxide wave was most useful, not only for early detection, but also for confirmation of the diagnosis. Although the incident of venous air embolism during arthroscopy is rare, the possibility has to be kept in mind.

References

1. Habegger R, Siebenmann R, Kieser CH: Lethal air embolism during arthroscopy. A case report. J Bone Joint Surg Br 1989; 71-B;314–6

2. Williamson JA, Webb RK, Russell WJ, Runciman WB: Air embolism-An analysis of 2000 Incident Reports. Anaesthesia Intens Care 1993; 21:638–41

3. Buxbaum JL, Muravchick S, Chen L: Intraoperative air embolism with pulse irrigation device. J Clin Anesth 1996; 8:519–21

Eveline A. M. Faure, M.D.
Associate Professor of Anesthesia and Critical Care
Richard I. Cook, M.D.
Assistant Professor of Anesthesia and Critical Care
David Miles, C.R.N.A.
Department of Anesthesia and Critical Care
University of Chicago
Chicago, Illinois
eaf3@midway.uchicago.edu

(Accepted for publication May 12, 1998.)